Gold in the News

Gold Catalyst Work Published in Nature

The leading scientific journal Nature has just published exciting research results from Prof Graham Hutchings, Cardiff University (Hughes M. D., *et al. Nature,* **437**, 1132 - 1135 (2005)). The work shows that non crystalline gold catalysts can provide tunable active catalysts for the oxidation of alkenes using air, with exceptionally high selectivity to partial oxidation products (98%) and significant conversions. In the catalyst, gold particles are stuck to larger motes of carbon, and it is believed that the interface between the two is the site where the oxidation reaction takes place. The research team used the metal bismuth to tune the activity of the gold catalyst by blocking certain sites on its surface. The London-based chemical company Johnson Matthey, who collaborated on the project are said to be ".....very interested in scaling up these gold catalysts," according to Hutchings.

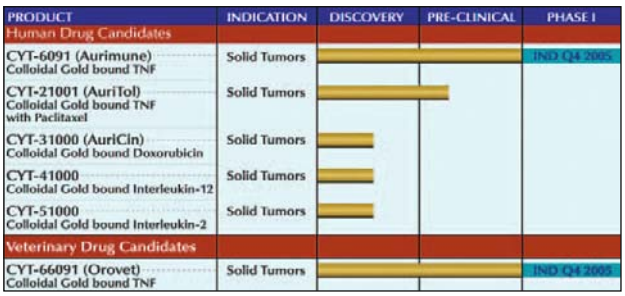
For more information see
http://www.nature.com/nature/journal/v437/n7062/abs/nature04190.html
and http://www.nature.com/news/2005/051017/full/051017-11.html

CytImmune Sciences to Manufacture Cancer Treatments using Gold

CytImmune Sciences, Inc., a clinical stage nano-biotechnology company focused on the delivery of therapeutics, has announced that it will enter into production of its first tumor-targeting biotherapeutic for an upcoming clinical trial sponsored by the National Cancer Institute. The company is poised to realise one of the first nanoparticle-based cancer therapeutics to be used in a clinical trial in humans, reported Dr. Larry Tamarkin, CytImmune's CEO and President.

CytImmune's proprietary drug development platform is based on colloidal gold nanopaticles. In 2000, CytImmune scientists discovered that pegylated colloidal gold nanoparticles bind anti-cancer therapeutics on their surface and carry these drugs safely through the blood stream. When injected into the circulation, these particles selectively accumulate in and around solid tumors due to the inherent leakiness of new blood vessels within the tumor. Based on the Company's research and chemical understanding of the nanoparticle, in-house scientists are able to bind almost any molecule to the carrier system.

Aurimune is CytImmune's first patented clinical drug candidate. CytImmune envisions producing a drug pipeline of pegylated colloidal gold-based products each of which will complement those already in the marketplace. Based on positive compassionate use results achieved in the treatment of more than a dozen terminally ill dogs and cats, CytImmune licensed the world-wide veterinary oncology rights for a veterinary formulation of colloidal gold bound TNF to Boehringer Ingelheim Vetmedica (BIV). BIV paid CytImmune an upfront fee, and will pay milestone payments and royalties on world-wide sales of this veterinary oncology product to CytImmune. All manufacturing, product development, and veterinary clinical trial costs will be borne by BIV. Phase I clinical trials in dogs are planned for late 2005 – early 2006.



For more information see
http://www.pharmalive.com/News/index.cfm?articleid=271071&categoryid=21
or http://www.cytimmune.com/

Liquidmetal Technologies Unveils Amorphous Gold Alloy

According to Physicsweb, researchers in the US have developed a new 18-carat gold alloy that they claim could replace existing alloys in a variety of jewellery, dental, medical and electronic applications. The new alloy developed by Jan Schroers and colleagues at the California Institute of Technology and Liquidmetal Technologies, also in California, contains gold, copper and silicon, with smaller amounts of silver and palladium (*Appl. Phys. Lett.* 87 061912).

Pure gold and high-carat alloys being crystalline, are of course soft and easily scratched or dented. In recent years researchers have tried to make amorphous gold alloys that do not suffer from this problem. Schroers and colleagues have now shown that alloys containing gold, copper and silicon, with smaller amounts of silver and palladium, have much better properties than existing alloys. The best alloy, Au49Ag5.5Pd2.3Cu26.9Si16.3, has a glass transition temperature of 401 Kelvin, a supercooled liquid region of 58 Kelvin, and a casting thickness that exceeds 5 millimetres. Furthermore, it has a Vickers hardness that is twice that of conventional 18-carat gold alloys.

The team now plans to vary the colour of the alloy while keeping the other properties
For more information see http://www.liquidmetal.com/
and http://physicsweb.org/articles/news/9/8/6/1

Gold-Coated Bacteria Creates Humidity Sensor

Scientists working at the University of Nebraska have used

gold electrodes and gold nanoparticles, in conjunction with bacteria and synthetic protein, to create a humidity sensor.

Reporting on his work on the online site Physorg, Ravi Saraf explained the basic principles behind the research. After being coated with a suspension of the bacteria Bacillus cereus, a gold electrode covered chip was dipped into a further solution of gold nanoparticles before being coated with a synthetic protein. This process results in gold-nanoparticle-coated bacteria that are still alive. When humidity is increased or decreased, the bacterial membranes swell, causing the gold particles to become further apart and thereby hindering the electrical flow between them.

According to Mr Saraf the humidity sensor demonstrates the vast potential that lies in hybrid structures containing micro-organisms and nanoparticles.

For more information see:
http://www.physorg.com/news7057.html

Mintek aims for plant to produce gold catalyst

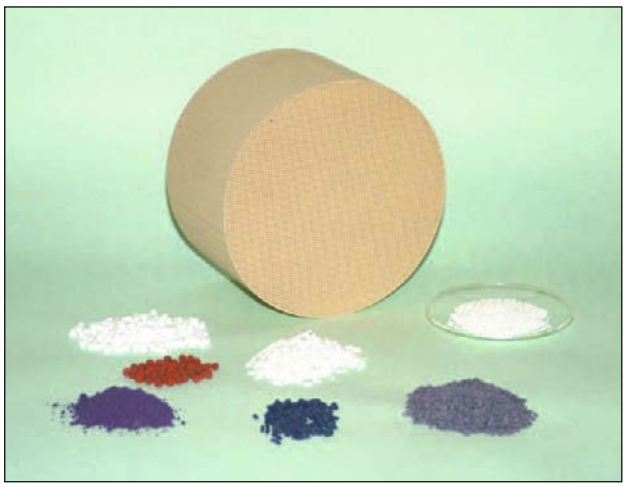
Mintek, South Africa's state-owned mining research company, is aiming to set up a plant to produce gold catalyst, chief executive Paul Jourdan has confirmed.

"We are working with a major European company that I can't identify yet on a large gold catalyst plant that we hope will be operating by 2007," Jourdan said in an interview at a mining conference in Cape Town. We have produced the catalyst at lab scale. We now have to make it on a larger scale." A final decision on the new plant, which would probably be built in Johannesburg, would be made by the end of next year.

The gold catalyst, which can be used in gas masks and air purifiers to remove carbon monoxide, might generate additional demand of 10 tons, or about 320 000 ounces, of gold a year, David Hodgson, AngloGold Ashanti's former chief operating officer, told a conference in February.

The government is encouraging companies such as AngloGold Ashanti and Harmony Gold Mining to process more of the metal they mine in South Africa to help create jobs.

For more information see:
http://www.busrep.co.za/index.php?fSectionId=&fArticleId=2884675



Mintek's gold catalysts

UtiliseGold™ Launched

UtiliseGold, a unique website designed to support the industrial uses of gold, was launched on the 19th September. UtiliseGold's aim is to provide an effective and convenient resource for engineers, designers, scientists, technicians, and managers seeking to use gold as a technical material. The site features:

- detailed information on the technical uses and practical applications of gold.
- a fully searchable international business directory with direct links to the websites of manufacturers of gold-based materials, chemicals and products.
- a daily newsfeed of the latest news on gold, specifically targeted at the industrial/scientific communities.
- details of novel gold-based technologies available for licensing and commercial exploitation.

Richard Holliday, Head of Industrial Applications at the World Gold Council, commented "www.utilisegold.com is free to use and is free to list products on and we believe that it will become the source for information on gold's industrial, medical and technical applications. There is massive global interest in gold and its uses and, given the success of other WGC gold-related websites, we anticipate a high level of good quality visitors to the site." Manufacturers of industrial gold products interested in listing their products in the UtiliseGold directory are invited to visit the website and follow the listed instructions.

See www.utilisegold.com

Libraries of Gold Nanoparticles

University of Oregon chemist Jim Hutchison's new way of rapidly generating a diverse library of functionalized gold particles was featured on the cover of the September 5 issue of Inorganic Chemistry.

The article described how to synthesize the versatile particles, built with cores of 11 gold atoms. One of the keys to understanding the size-dependent properties and applications of nanoparticles is generating libraries of particles with different sizes for physical study. Earlier this year, Hutchison's laboratory reported success in generating a similar library of larger particles, with cores having about 100 gold atoms, in the Journal of the American Chemical Society. The 11-atom and 100-atom libraries span a size range of 0.8 to 1.5 nanometers, a range of particular interest to nanoscientists and technologists.

For more in formation see
http://www.physorg.com/news6230.html